Results of Interviews with Hot Mix Asphalt (HMA) Producers

The King County LinkUp Project Team identified six central Puget Sound hot mix asphalt (HMA) producers to question regarding their awareness and experience of incorporating asphalt shingles into HMA. Five of the six producers identified participated in interviews conducted in February 2008. In the interviews, producers were asked a set of eleven questions. A summary of the five producers' responses are summarized below by question. Following the summary are the raw notes from each interview.

Summary of Responses by Question

1. Are you aware of efforts across the country to incorporate tear-off shingles into HMA? Are you aware of the King County LinkUp initiative?

All producers interviewed were aware of efforts across the country to incorporate tear-off shingles into HMA and of the King County LinkUp initiative. One producer thought that efforts around the country have not been very successful and wanted to know what King County is going to spec. The same producer said that one of the biggest problems would be what is "going into the air."

2. Do you know of upcoming paving projects that could serve as a good demonstration project in King County?

Three producers had ideas about the types of paving projects that could serve as a good demonstration project, but none mentioned specific projects. One producer mentioned arterial streets, while another mentioned that his first choice would be a transfer station, parking lot, bus garage, or transit facility because they are easy to monitor (do not need to block traffic). A third thought that King County Overlay could easily incorporate the pilot into a street or two.

One interviewee did not feel he knew enough about the demonstration project to say what type of project will work well although he thought that it would be more costly to do the project on a small scale. The same person mentioned that the biggest issue will be for the manufacturer to feel that processing the shingles will go smoothly in his plant.

3. Are you using recycled asphalt pavement (RAP) currently?

All five producers are currently using RAP.

4. Is the plant a drum plant or batch plant?

Three producers have only drum plants. Two have both drum and batch plants. One producer said that a lot of batch plants are starting to get away from batch by adding a second drum that flows in parallel.

The table below presents a list of the plant locations mentioned by each of the companies interviewed.

Company	Plant Location
Woodworth & Company, Inc.	One in Lakewood and in one in Sumner.
Wilder Construction Company	One plant in Whatcom County, one plant in

	Snohomish County in Everett, and one in Olympia
ICON Materials	Seattle and Auburn
Watson Asphalt Paving Co., Inc.	
Lakeside Industries	Main plant is in Issaquah, one plant in Seattle, one in Monroe, and one in Redmond

5. Have you done any test mixes with shingles?

One producer has done test mixes recently in the lab and is thinking about doing more. Based on initial test mixes, he thinks that shingles should be ground to ½" minus with 80% being ¼" minus. Another tested it about seven years ago. One thought his company tested it 15 years ago and, from what he has heard from others in the company; it was a disaster in that the grit clogged up oil lines and tacks from reprocessed shingles ended up in the pavement. Since then, the plants have changed. Two producers have not done any test mixes.

One producer felt that he needed more information regarding the demonstration project, such as whether the asphalt manufacturers would need to process the shingles themselves and whether existing permits would be sufficient.

6. What is the impact on the mix design of adding shingles at a batch plant? Would it be best to use shingles in place of or in combination with RAP? What is most cost-effective?

Four of the five producers thought adding shingles would not negatively affect the mix properties as long as it was done in moderation and according to specific criteria and methods. Challenges included not knowing the quality of the shingle asphalt, melting and distributing the shingles throughout, and grinding and sizing the shingles properly. Concerns about the asphalt shingles included that the binder may be softer and more prone to rutting; that they might make the mix stiffer and affect the compaction; and that tear-off shingles may be harder, more abrasive, and more difficult to size than manufacturing scrap. Another producer thought that there would be minimal impact except to the volumetric properties of the mix, although he thought that would be a consideration regardless of whether plant was at a batch or drum plant.

One producer believed that adding shingles might increase air pollution.

Two producers favored using shingles in combination with RAP. One said it would be ideal to mix the softer binder from shingles with harder binder from RAP; he also said that RAP is not considered a huge barrier anymore since the impacts of using RAP are well understood at this point. A third manufacturer thought that you should start with just shingles, and then maybe try it with RAP.

7. What is the standard virgin binder?

All five producers said that the standard virgin binder is PG 64-22.

8. What are the minimal tons of HMA necessary to cost-effectively produce the HMA RAS mix (2,500-3,000 was mentioned at the advisory group meeting)?

Responses for the minimal tons of HMA included 1,000 tons (2 producers), 2,000 tons, and 1,500 to 3,000 tons.

9. Is there anything else that we should know to help this project be successful?

- There are a lot of examples (15 or 16 states that are allowing the use of it) that can tell you the potential problems. Ultimately the product should be as good as super pave.
- You should specify what type of gradation you want in the shingles (e.g., 80% ¼ minus/20% ½ inch minus).
- To make the project worthwhile, it should be at least 1,000 tons because plants don't run efficiently at smaller batches; although batch plants can run smaller amounts they will have more trouble.
- You should consider the technical issues already discussed. Shingles could probably be cost effective, but it depends on the capital costs (processing, covering, grinding, and feeding).
- The initial group that has been assembled should be able to address most of the issues. Tear-off shingles will have different problems than other shingles. There should be good specifications for the shingle recyclers to meet.

10. What is the best use (cost effective and life cycle) for RAS? Asphalt treated base (ATB) course? Level course? Wearing course?

All five producers thought it would be best used as a non-surface course. One producer thought that would make a pilot project more difficult to evaluate. For this reason, he thought it would work well to conduct the pilot on a surface that could just include a base course for a time, which would allow for testing while maintaining the option to add another lift eventually. Ideally, he said, would be to place a traditional mix adjacent to the test mix. A second producer thought it should also be on a non-surface course, although he felt that was more important for the design engineer to determine than the asphalt producer. The third interviewee mentioned that an ATB or base course would be a good first step and that it could be used in a surface course after the material was accepted. The fourth producer felt there were too many questions about how the mix will perform for it to go on a wear course. The same producer expressed doubts that there would be any benefits to using shingles in HMA. The last producer interviewed mentioned that, while he thought you could use recycled shingles in all mixes, it would probably be best in a base course as that could use higher percentages of shingles.

11. Are you aware of any special conditions for use? Temperature? Compaction?

While one producer thought studded tires may be a problem, the other four producers were not aware of any special conditions for use. The first of these three producers mentioned that there may not be any real concern regarding temperature as the stability numbers were superior in their lab testing. The second producer was not aware of any special conditions although he thought that there are unknowns with how shingles will breakdown in the plant. The third producer though that long-term rutting would probably be

more of a concern than temperature or compaction, if the product is a little softer. The fourth found that the stiffness of the oil in shingles makes the paving difficult to compact.

List of Producers Interviewed

John	Grisham	Woodworth & Company, Inc.	253-383-3585 ext. 252	jkgrisham@woodworthandcompany.com
Bill	Brickey	Wilder Construction Company	425-551-3100	billbric@wilderconstruction.com
David	Gent	ICON Materials	206-575-3200	dave.gent@oldcastlematerials.com
Cliff	Schroeder	Watson Asphalt Paving Co., Inc.	425-868-4377	pschroeder@watsonasphalt.com
Dave	Bell	Lakeside Industries	425-313-2600	daveb@lakesideind.com